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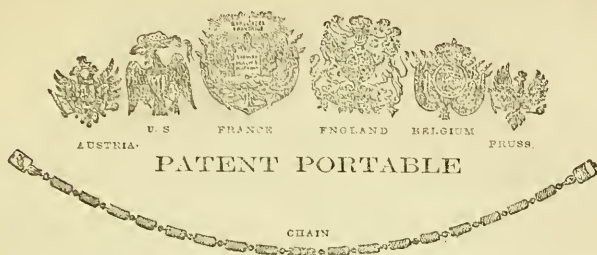








# J. L. PULVERMACHER'S



## Hydro-Electric Voltaic Chain Batteries.

SOLD BY

**J. STEINERT,**

(SOLE AGENT FOR THE UNITED STATES,)

568 BROADWAY,

METROPOLITAN HOTEL, CORNER OF PRINCE STREET,

NEW-YORK.



This Pamphlet for professional gentlemen. A special Pamphlet for personal use.



New-York :

PRINTED BY C. DINSMORE AND COMPANY.  
NO. 22 SPRUCE STREET.

1853.

## The Patent Portable Hydro-Electric Chains

HAVE BEEN EXHIBITED, ACKNOWLEDGED, OR APPLIED,  
BEFORE THE FOLLOWING SCIENTIFIC BODIES:

### New-York.

ACADEMY OF MEDICINE.  
MEDICAL COLLEGE, CROSBY STREET.  
DO. 13TH "  
DO. 14TH "  
CITY HOSPITAL, BELLEVUE & WARD'S  
ISLAND HOSPITALS, ETC.

### London.

ROYAL COLLEGE OF PHYSICIANS.  
DO. SURGEONS.  
ROYAL BRITISH ASSOCIATION.  
PHARMACEUTICAL SOCIETY.  
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ROYAL FACULTY OF MEDICINE, ETC.  
ETC. ETC.



# PULVERMACHER'S

## PATENT

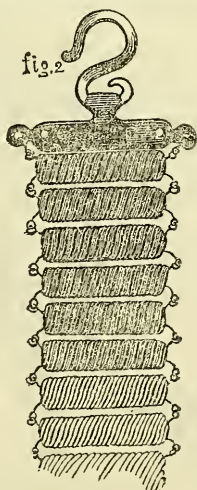
### PORTABLE HYDRO-ELECTRIC CHAIN BATTERIES

Contain, under the volume of a pocket-book, the whole metallic arrangement of sixty to one hundred and eighty voltaic elements, constantly prepared in such a manner that they can be brought to act immediately by using a little vinegar. They are flexible in every sense of the word, and give a continuous or interrupted (accompanied by shocks) current through eight or ten persons, always in the same direction, and of any desirable power. Besides this, the currents which they develop are primary galvanic ones, of a very different physiological influence to the secondary and irritating currents developed by the Electro-Magnetic Machines. By a momentaneous immersion into a glass of vinegar, the Chains absorb a quantity of the liquid sufficient to make them act for half an hour, and the action is instantaneously renewed on each fresh immersion. No arrangement, no cleaning is wanted before or after the use of them. Every complete apparatus is of the volume and form of a book or cigar-case, and may easily be put into the pocket.

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#### DESCRIPTION.

Every link of the Chain consists of two galvanic metals, at a little distance from each other, but disposed in such a manner as not to touch each other (see figure 2). By a momentary immersion into the



Liquid, the latter is absorbed by the capillary power of the two metals, and thus the galvanic element is perfectly established.

The links are hooked into each other with gilt wire, in such a manner that the zinc end or pole of one link is connected with the copper pole of the next link, by the said gilt wire. This forms a complete voltaic pile, the power of which simply depends on the number of links or elements generating the current, which is disengaged at the two extremities as soon as the chain has been moistened (viz. : at the two last links, or elements).

One link deflects the magnetic needle of the galvanometer—four elements decompose acidulated water—six links water which is not acidulated ; with 15 links the electric current passes through the human body, produces sparks before the eyes, and all other physiological phenomena. Of a chain of 50 to 60 links, the shocks are very perceptible ; 80 to 120 links produce a power sufficient for all cases ; but still the number of links or chains may be increased to such a point that the shocks become insupportable. The chains are made of a convenient length, and at each extremity they are provided with a hook (a white one on the zinc pole, and a gilt one at the copper pole). If the effect of several chains is desired, the poles of contrary names must be brought into contract.

## AUXILIARY APPARATUS.

[A.] *Two Metallic Tubes, with Insulating Handles (Conductors)*, (see figure 4,) which are hooked in at the free ends (poles) of the chain, to communicate the electric current to the body in a more perfect manner.

[B.] *Conductors with Brush or Sponge* (see figure 3), which are used to introduce the electric current into the mouth, ears, etc., moistening the brush or sponge with water or vinegar, and hooking one end (pole) of the chain to this instrument, while the other end or pole of the chain is applied by one of the tube conductors to any other part of the body, where it is desirable to let out the electric current.

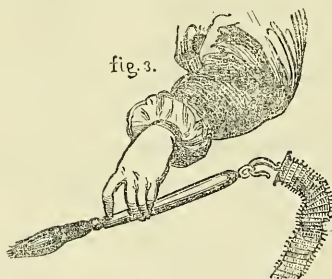


fig. 3.

[C.] *Conductors for Electro puncture*.—A needle of platina to introduce the current into certain internal parts of the body where direct and local effects are wanted. The Chain is applied as with the brush conductors, but it is generally preferred to introduce the needle first, before the electric current is established.

[D.] *Conducting Bougie in Caoutchouc* (India Rubber), to introduce the electric current into the passage, etc. The bougie is introduced with the metal wire inside ; the metal wire then withdrawn and moistened in water ; it is then introduced again, but not quite so deep as to go to the end, for fear of passing it through one of the holes and hurt the patient. If one of the poles of the Chain is then hooked to the end of the metal wire, the other may be applied to any other part of the body, and the current is established.

[E.] *The Interrupting Cylinder* (see figure 4) is a small tube with a copper ring at each extremity ;

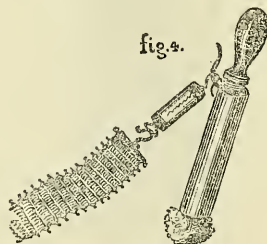
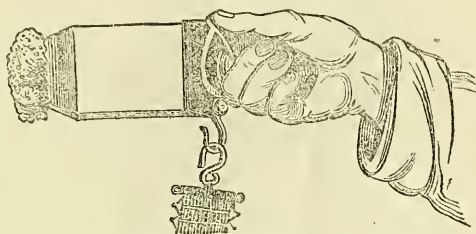


fig. 4.

it contains a moveable metallic spiral wire. If it is put between two chains, or between the conductor and one pole of the Chain, the current is alternately interrupted and renewed by every movement of the cylinder, which produces a consecutive but irregular impulse or shock.

[F.] *The Interrupting Clockwork* (see figure 5) is the most perfect apparatus for interrupting and renewing the electric current in a regular manner, and just as it may be desirable. As the movement of the clockwork is fixed in a metallic conductor with an insulating handle, which at the same time serves to wind up the movement, nothing remains to do but to hook the Chain to this conductor or metallic box, and to make the movement go in order to communicate or to feel the interrupted shocks, the rapidity of which is regulated with mathematical precision by a horn pin at the side of the handle, and which, even in experimenting, may be pushed to the right or left with the thumb, just as the shocks are desired, more or less rapid, or none at all. The intervals of the shocks may be reduced from one second to such a rapidity of shocks that a Chain of 100 to 120 elements will contract the strongest arm, or any muscle which is wished to contract; besides this, the extreme rapidity of the impulses given, prevents all painful sensations with which other apparatuses are generally accompanied. The importance of this apparatus can scarcely be exaggerated, particularly in the treatment of hemorrhages, in accouchements, etc., where the regularity of impulses given is of the highest importance, and in cases of paralysis of the motor nerves, without affection of the nerves for sensation, a disease in which, until now, scarcely any shocks strong enough could be employed, on account of the acute pains accompanying them.

fig. 5.



[G.] *Voltmeter, or Apparatus for Decomposing Water* (see figure 6).—A tube of glass, fixed on a wooden stand, with two hooks. If the tube is filled with water, and one pole (end) of the Chain is fastened to one hook, while the other pole is kept in one hand, and if the other hand, which is disengaged, then takes hold firmly of the other hook on the wooden stand, (both hands being moistened for conducting better), the quantity of gas disengaged inside the tube at the platina threads, will show the measure of the electric current passing through the body.

fig. 6.



## MODE OF APPLICATION.

The electricity of the Chains is excited by immersing them in vinegar about ten seconds. This ought to be done in passing the Chain through the liquid from one end to the other, thus, that every part of the Chain get equally charged with the liquid; but as little as possible must remain between the links.

We distinguish six different forms of physiological effects in the Hydro-Electric Chains :

1. *Simple Shocks* (nervous-muscular contractions).
2. *Vibratory Impulses*, without regular intervals.
3. *Impulses with regular intervals*.
4. *Powerful Nervous Muscular Contractions*, by a succession of shocks following each other with extreme rapidity.
5. *Continuous Currents*, without interruption.
6. *Continuous Currents and Impulses communicated together*, through the body of the operator.

1st. To produce *simple shocks* hook a chain of 30 to 60 links with its zinc-pole to one of the two metal tube-conductors, while another chain is hooked with its copper-pole to the other conductor. After having moistened your hands with water or vinegar, take both conductors, the ends of the chain hanging downwards. At the moment when the free ends of the chains are brought into contact a shock or muscular contraction is felt in the hands, arms, and in the chest (see figure 7).

fig. 7.



The power of this shock is greater if the chains are brought to touch each other at the very extremity, and will get less the nearer to the conductors they are brought in contact.

fig. 4. bis

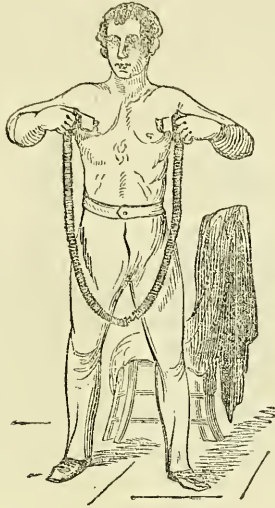


2nd. *Vibratory impulses, without regular intervals*, are felt if the two chains are united by the interrupting cylinder in such a manner that the spiral wire inside the cylinder is made to vibrate (see figure 4 bis, above.)



3a. *Regular impulses or vibrations* are communicated by the above-mentioned interrupting clock-work. The chains are hooked together with their contrary poles as to form one chain; one extremity is then hooked to the interrupting clock-work, and the other to a common conductor. The clockwork is then wound up by turning the handle from the left to the right, and by the horn-pin the shocks are then properly regulated (see figure 8).

fig. 8.



4th. *Strong Contractions* are produced in the same manner by the interrupting clock-work, if the horn-pin is pushed so far as to produce the most rapid shocks, but care must be taken to apply the two conductors on two different parts of the same muscle, in order to produce the most perfect contraction.

fig. 22.



5th. To produce a *continuous current* the white (zinc) pole of one chain must be hooked to the gilt (copper) pole of the other, without introducing the interrupting cylinder, and the free ends to which the simple conductors are hooked, and then brought to those parts of the body where the electric current is to pass in and out. This application does not produce anything but a slight prickling and an itching on the zinc pole, but the effect on the body is of a chemical character, and, probably, at the same time, of a magnetic one too, which ought always to be kept in view in a galvanic treatment.

[As in all chronic diseases it requires a long time in order that this mode of applying electricity may produce all its effects, and although short Chains may be employed to attain this aim as batteries, other Chains have been constructed also, which are much lighter and more portable, which may be worn a long time and without any inconvenience under the garments. The mild but continuous influence of these portable sources of electricity is as yet but little known to the science, for the simple reason that there was, until now, no apparatus of sufficient intensity to penetrate through the epidermis, and at the same time they have not been small and convenient enough to be worn on the body. But the results which we have obtained with them during the last few months, since they have first been published in England (particularly in chronic diseases, arising from alony in the functions,) are so astonishing and numerous, that we cannot recommend too strongly the use of these portable Electric Chains to the consideration of physicians. It has been ascertained that they act more favorably by shock in the effects of a galvanic treatment, and they assist very much in considerably increasing the efficiency of specific medicines. A great number of chronic affections of the liver, of the stomach, abdomen, kidneys, rheumatisms, and inveterate neuralgia, ulcers of long standing, amenorrhea and hemorrhoids, have been cured by employing this remedy. Small chains at a low price will be found at the office (J. STEINERT), corner of Broadway and Prince streets (Metropolitan Hotel), together with a pamphlet for personal use, and plenty of testimonials of private parties.

To produce the different effects of the Electric Chains above mentioned, the two metallic tubes are hooked to the two extremities of a chain, or two extremities of more chains (always observing that they are hooked together with contrary poles) and then brought in contact with those parts of the body, where the Electric Current is to pass in and out.

Two principles must then be kept in view :

1. *The Electric Current passes from the Copper (gilt) pole to the Zinc pole in a straight line, or takes the shortest route.*

2. *The Electric Current ought to pass through those parts of the nerves where the disease is situated.*

If the Electric Current has to pass through the hands, arms and chest, the metallic parts of the tube are simply taken in the hands, having previously moistened the latter with water or vinegar. To any other parts of the body the Conductors are kept by the insulated handles and they are applied by their metallic surface moistened, or after having placed moistened sponges in the hollow tubes. The skin also ought to be moistened at the parts, where the conductors are applied.

The Electric Current may likewise be communicated by a bath, (see figure 9), either continuous or



interrupted. The water ought to be acidulated and of any desirable temperature, and the part where the Electricity is wanted to enter put into the water, together with one Conductor to which the Chain is hooked, while the other Conductor is applied to that part where the Current is to pass out. Simple shocks will then be felt as often as the Conductor is taken out of the water and then plunged in again. For other impulsive effects, the interrupting cylinder is introduced between the Chains, or between the Chain and the Conductors, but care must be taken always that the interrupting cylinder be kept dry. These baths are recommended in such cases where at one and the same time it is required to act on all the nervous ramifications of a certain part of the body ; they may be replaced by moistened linen laid on the body and brought in contact with the metallic surface of the Conductors.



# CONTINUOUS ELECTRIC CURRENTS AND MIXED IMPULSES COMMUNICATED THROUGH THE BODY OF THE OPERATOR.

As soon as the chains are hooked together without interruption, the operator keeps one of the moistened conductors in the hand, and the patient the other; the shock may then be communicated by the fingers or the hand of the operator which is left free to all parts of the patient's body, in a mild and pleasant manner, so that the operator gives slight shocks with his fingers, employing the palm of his hand on the surface of the patient's body if he wants to act on a nerve, or an important ramification, or in passing his hand, charged with Electricity, up and down such parts as may be affected with Rheumatism, Contraction, Paralysis, etc. (see figure 10). This mode of application has procured to us very happy results, in Rheumatism, in Pains accompanied by swelling and other similar affections. We can recommend it most particularly.

fig. 10.



If two persons have each a conductor in one of their hands, and if they then join their disengaged hands (moistened beforehand) they feel the same shock or sensation, as described above, the momentary touch and the disengaging again of the hands, acting the same as the interrupters. The same experiment with chains, from 100 to 120 links, may be made by 8 or 10 persons, provided they all have moistened their hands and keep them firmly shut, in order that the Electricity may pass freely through them from one to the other (see figure 11).

fig. 11



Taking a view of the Hydro-Electric Chains as to their therapeutie effects, the shocks are naturally an energetic stimulant to the nervous system, animating instantaneously their power and sensibility, if their number is regulated corresponding to the case acted upon; but they are followed by a sort of languor and numbness if they are employed too long. The continuous currents through the body without any shocks are a milder form of the same stimulant, and although in appearance less energetic, they penetrate very efficiently into the body and have an exceedingly salutary effect in inveterate affections.

The current developed from the Hydro-Electric Chain is a Voltaic Primary current and its effects on the human organization very different from the Secondary Magneto-Electric or Electro-Magnetic, irregular and turbulent currents of the ancient apparatus. The current of a Hydro-Electric Chain invariably passes in the same direction and completes the Electric Circle through the body from the Copper (gilt) pole to the Zinc pole.

With these Chains all the other effects of a battery of 120 elements can be produced. The decomposition of water, the precipitation of metals from solutions, galvanoplastic, galvanotyping, decomposition of metallic salts in solution, and electro-magnetic and thermal effects. All auxiliary apparatus for all these experiments may be had on applying to our office at New York.

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## CHAIN BATTERIES TO SELL.

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### [A.] BATTERIES IN BOXES.

No. 1—Morocco: containing 2 Chains of 60 elements each; interrupting clockwork, interrupting cylinder, conductor, with brush for mouth, ear and teeth; instrument for galvano-puncture. Price, \$22.50.

No. 2—Morocco: containing 2 Chains of 60 elements each; 2 conductors, interrupting cylinder, conductor, with brush for mouth, ear and teeth; instrument for galvano-puncture. Price, \$16.

No. 3—Morocco: containing 2 Chains of 48 elements each; 2 conductors, interrupting cylinder, conductor for mouth, ear and teeth. Price, \$12.50.

No. 4—Morocco: containing 2 Chains of 36 elements; 2 conductors, interrupting cylinder, conductor for mouth, ear and teeth. Price, \$10.

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### [B.] BATTERIES IN POCKET-BOOKS.

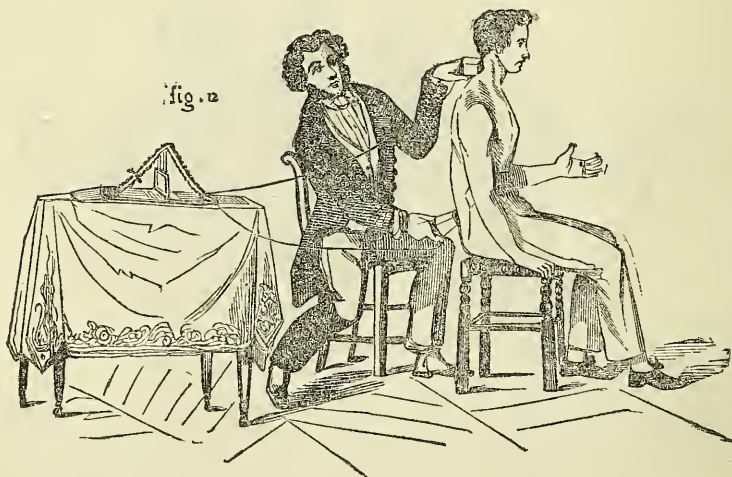
The form of this apparatus is as simple as possible, with regard to its size. The whole of it, with its auxiliary apparatuses, is made up in form of a pocket-book not larger than a cigar-case. It has, besides, the advantage that its batteries may be employed by leaving the Chains in the case.

[aa.] Two Chains, with their contrary poles opposite each other.

[bb.] Pieces of insulating horn, to which are hooked the Chains.

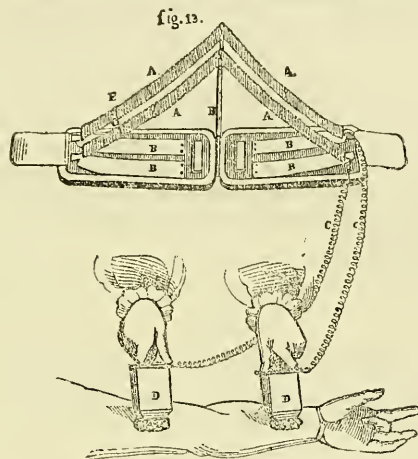
[cc.] Metallic threads, span over with silk, to conduct the electric current to the conductors.

[dd.] A hooked wire to effect the contact of the two Chains, in order to complete the electric circle (see figures 12 and 13).



After having taken out the Chains, moistened them with vinegar, they are fixed again in the pocket-book in such a manner that the white pole of one Chain, and the gilt one of the other, are together on

the same side. Then two poles on one side of the pocket-book are brought in contact by the hooked wire ; to each pole on the other side of the pocket-book are then hooked the metallie threads, with the conductors hooked to them. In order, then, to produce consecutive impulsions, an interrupting cylinder is introduced between one of the two threads and the conductor ; or one of the threads is hooked to one of the above-named interrupting clockwork. To produce simple shocks, the conductors must be brought to the body ; the crooked wire is then taken off the Chains to break the contact between them ; as soon, then, as the contact is reëstablished by fixing the crooked wire again to the two Chains at once, a shock is felt at those parts of the body where the conductors have been applied. The power of the battery may simply be modified by taking off the crooked wire from the extremities of the two Chains, and hooking it in again nearer the conductors, thus bringing in contact a less number of elements within the electric circuit. Care must be taken that the whole case in which the Chains are kept, be dry, and that the two Chains have no other connection between themselves than by the crooked wire.



No. 1—Pocket case in morocco, gilt frame, containing 2 Chains of 40 elements each, 2 conductors, with 2 threads. Price, \$12.50.

No. 2—Pocket case in morocco, gilt frame, containing 2 Chains of 36 elements each, 2 conductors, with 2 threads. Price, \$10.00.



## UNITED STATES.

*Letter from VALENTINE MOTT, M.D., L.L.D., Emeritus Professor of Surgery and Surgical Anatomy of the faculty of Medicine at New York, Honorary Fellow of King's and Queen's College, at Dublin (Ireland), etc.*

NEW YORK, October 12th, 1852.

MR. J. STEINERT:

Dear Sir,—I have been much pleased with the Hydro-Electric Chains of Pulvermacher, which you have been so polite as to furnish me. They are a very ingenious and beautiful arrangement of the galvanic principle, and I have no doubt will lead many medical practitioners to use this powerful agent from their neatness and convenience. They are so portable, and at the same time powerful, that many will resort to them, and indeed be amused by them, who would be alarmed at a more complicated apparatus.

*I think it may become an important remedial agent, and its efficacy may be greatly increased if used in the manner of galvano-puncture.*

You have my best wishes for its successful introduction.

Your's very respectfully,

V. MOTT.

### ACADEMY OF MEDICINE, NEW YORK.

*Extract from the records of the Committee on Chemistry and Pharmacy, to the above Academy, at the meeting on the first of December, 1852.*

#### COMMITTEE:

DES. MACNEVEN, SAYRE, GARRISH AND TAYLOR.

"In regard to the Electro Voltaic apparatus of Mr. Pulvermacher, for medical purposes, every facility was afforded the Committee, by Mr. Steinert, of testing its applicability. This instrument was found to be, essentially, an ingenious modification of the original Voltaic pile; it consists in a chain composed of a series of zinc and copper wires, arranged on bits of porous wood, by simply moistening this Chain with vinegar, or acetic acid, it is prepared for action, the porous material entering into its composition, holding, as in Volta's apparatus, the requisite fluid.

"A Galvanic instrument of this form is well calculated for medical purposes, from being so readily available when required. In examining it, in reference to its advantages for ready application, the power, intensity, and permanency of action it was capable of manifesting, was also duly considered.

"The Chains exhibited to the Committee were of two sizes, with powers proportionate to their respective dimensions. The smallest sized Chain is intended where moderate power only is requisite; the larger Chain is intended to supply a power equal to any demand, which would probably be made for medical purposes. One of the latter size, after having been once thoroughly moistened with vinegar, and left exposed to the air, was found to be capable of deflecting the galvanometer for two hours and a half. If enclosed in oiled silk, as the Chains are designed to be when worn upon the person, this action is of course prolonged. In the ordinary use of the instrument, however, the permanency of its action must be maintained by moistening the Chain from time to time, say about once in fifteen or twenty minutes, with vinegar. The number of links may be readily increased by connecting two or more Chains together, and the intensity of the Galvanic current proportionately increased. Four Chains, of sixty links each, having been thus connected, the intensity of the electric current was found to be augmented to a degree too painful to endure.

"The most complete form of the apparatus examined, is provided with a handle, containing an armature moved by clockwork, for regulating the circuit. In the less complete form of the instrument an attachment, containing a spring, is provided, which may be made to effect, though imperfectly, the same purpose.

"On the facts above stated the committee is of opinion that the Voltaic Chain of Mr. Pulvermacher, while it presents an instrument of the requisite efficiency, has the advantage, for medical purposes, of being more portable, more readily available, and more economical in its use, than the electro-galvanic instruments at present employed."

*Extract from the "New York Medical Times," Vol. I., No. XII., of September, 1852.*

We are glad to learn, that we are about to have introduced into our country the Portable Hydro-Electric Voltaic Chain, invented by Dr. Pulvermacher, the virtues of which have been so well tested in England for several months past, and which comes to us with such high testimonials in its favor. It is a modification of the Voltaic pile, giving us all the effects of Galvanism in a form much more convenient and much more manageable, than the machines in ordinary use, and less apt to get out of order. It has the very desirable property of creating a continuous uninterrupted current of electricity of moderate tension, and always in one direction.

The inventor received the unanimous thanks of the French Academy of Medicine; and the practical value of the instrument is attested by Drs. Golding Bird, Pereira, and many others of the first medical men in London. An agency is about to be established in this city, the particulars of which will be made known by means of circulars and advertisements, when the arrangements are completed for the requisite supply of the instruments. In the meantime, the merits of the article will be tested at the different hospitals and in private practice, as cases proper for its use may present themselves.

---

I have seen with much satisfaction the application of the Hydro-Electric Chain of Pulvermacher. The neatness of its construction, and the facility with which so important a therapeutic agent as the electric current can be administered, render this modification of the voltaic pile highly eligible and convenient.

*In amaurosis, neuralgia, and other nervous maladies I deem its use highly expedient.*

J. M. CARNOCHAN, M.D.

Professor of Surgery in the New York Medical College,  
Surgeon to the State Emigrant's Hospital, etc.

NEW YORK, 29th Oct., 1852,

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I have employed Pulvermacher's Hydro-Electric Chain, lately introduced amongst us by Mr. J. Steinert, and am satisfied *that they constitute the most effective and uniformly available apparatus for the therapeutic application of electro-galvanism of which I have any knowledge.*

WM. H. VAN BUREN, M.D.

Surgeon to the Bellevue and St. Vincent's Hospitals, Professor  
of Anatomy in the University at New York, etc.

NEW YORK, 15th Oct., 1852.

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I have made trial of Pulvermacher's Hydro-Electric Chains, and regard them as a very convenient and efficient contrivance for the application of electricity in the treatment of disease. The portability of the instrument and the facility of its application are such as to render it superior, in my opinion, to any other electrical apparatus employed for medical purposes.

ALFRED C. POST, M.D.,

Professor of Surgery in the University of New York.

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MR. J. STEINERT:

Sir,—The Hydro-Electric Voltaic Chain of Mr. Pulvermacher has been used at the New York Hospital in cases under my direction with very satisfactory results, and I consider it as an efficient and particularly convenient and eligible mode of applying this therapeutic agent.

Your's, etc.

H. B. BULKLEY, M.D.

NEW YORK, Oct. 19th, 1852.

Physician to New York Hospital.

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I have known the Hydro-Electric Chains of Pulvermacher used in cases of paralysis, with very great benefit to the patient, and am so favorably impressed with their good effects that I shall continue their employment where agents of this kind are indicated.

Their portability and ease of application are great recommendations.

JOHN J. METCALFE, M.D., 735 Broadway.

OCT. 29th, 1852.

Physician to Bellevue Hospital.

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I have employed Pulvermacher's Electric apparatus in my practice, and esteem it superior in all respects to any other now in use.

DANIEL AYRES, M.D.,

Surgeon to Brooklyn City Hospital.

BROOKLYN, Oct. 15th, 1852.

I have used the Electric Chain of Mr. J. Steinert, and consider them the most convenient form of medical electricity; they are effective, easy of application, and very convenient for the physician and patient.

WILLIAMSBURG, 452 Grand street.

F. M. LORETTE, M.D.

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Similar highly commendatory testimonials have been received from many other members of the profession, who have experienced and tested the effects of the Chain, as, for instance, from:

E. H. VAN DEUSEN, M.D., Physician New York City Hospital.

THOMAS F. COCK, M.D., Physician Bellevue Hospital.

ULRIC PALMEDO, M.D., Brooklyn.

H. N. WILHELM, M.D., New York.

GEORGE A. PETERS, M.D., New York.

Etc.

etc.

etc.



## ENGLAND.

48 RUSSELL SQUARE, 29th Aug., 1851.

The ingenious modification of Volta's Pile, invented by Dr. Pulvermacher, was placed in my hands several months ago, and I have had the opportunity of testing its value. This apparatus is capable of producing all the physiological effects of the well-known Galvanic Battery, each link of the Chain corresponding to a cell of the latter very cumbrous and (for medical purposes,) inconvenient machine. It is easily excited, and its power is very persistent. With careful management it is not likely to get out of order.

We have in this ingenious invention that which has long been a *desideratum*, viz.:—an apparatus of the smallest possible bulk capable of evolving a *continuous or uninterrupted* current of Electricity of moderate tension and *always in one direction*, without the expense, bulk, and great inconvenience of the Cruikshank Trough or other Cell arrangements. *I can hardly recommend Dr. Pulvermacher's invention too strongly to the notice of my medical brethren.*

GOLDING BIRD, A.M., M.D., F.R.S.

Fellow of the Royal College of Physicians, Physician to and Lecturer on Therapeutics at Guy's Hospital.

FINSBURY SQUARE, Sept. 9th, 1851.

I have great pleasure in stating, that I consider Pulvermacher's Patent Portable Hydro-Electric Chain Batteries to be a very convenient and effective form of a Voltaic Apparatus for medical purposes.

JONATH. PEREIRA, M.D.,

Fellow R.C.P., Physician to London Hospital.

*Extract from "The Medical Times" of November 15th, 1851.*

*Cases of Rheumatism and Local Paralysis, treated by Pulvermacher's Chain Battery. Reported by T. J. Vallance, M.R.C.S., &c.*

In introducing the following cases to the notice of the Profession, I may observe that they are not picked ones, but are simply taken as they occurred; also, that they have been treated *only* by electricity; the instrument used being Pulvermacher's Chain Battery. Whether the superior efficacy of this Battery in rheumatic and local paralysis over the Electro-Magnetic Machines, is due to the circumstance of the current being primary, or to the fact that the current is constantly in one direction, is a question I shall at present leave; but the cases I have treated appear to me very striking in the rapidity with which they have been cured, as compared with any that I have found recorded to have been treated by galvanism, evolved from other sources.

### CASE FIRST.

Alfred Cooke, age 26, a gardener, was attacked on the 4th of July, 1851, with acute rheumatic fever. He was treated in the usual manner, and was confined to his bed about a fortnight after, suffering much in the muscles of his extremities and back. After he was able to leave his bed, he had great *pain in his shoulders, wrists, and loins*, increased by the slightest motion, so that he was incapable of dressing or feeding himself. He continued in this condition up to the 29th of August, (nearly nine weeks,) during which period he was treated by tonics, occasional doses of Dover's powder, and turpentine frictions; these, however, had no apparent result.

On the 29th I found his arms hanging useless by his sides; the right was somewhat the worst; it felt cold, the skin tense and hard, and the *muscles much atrophied*; the hand he was unable to close. The metacarpal joint of the *index finger* was much *swollen*; it felt hard, and was very painful on pressure, or on any attempt to bend it. Thinking this a fair case for the application of galvanism, I resolved to try the Chain Battery, and accordingly passed a current from one hand to the other. The first effect produced was considerable faintness; the man, however, quickly rallied, and ten minutes having elapsed, I

found he could close his hand perfectly, that the swelling was considerably diminished, and that all pain was gone. The same evening he undressed himself without assistance.

Aug. 30th.—Arms slightly painful on motion. The current was again passed *with marked benefit*.

Aug. 31st.—A good deal of pain in hip and knee, increased by movement. The current was passed in the direction of the sciatic nerve, *which removed the pain*.

Sept. 3rd.—Slight returns of pains and immobility in the upper extremities, *speedily removed by the passage of a current*.

From this date to the 10th, as there remained some trifling stiffness in the limbs, a moderate current was passed every morning. Its use was generally followed by a little diaphoresis, and a slight feeling of exhilaration.

On the 11th the man returned to his work.

#### CASE SECOND.

Edward Connor, aged 60, a laborer, strong habit of body, has been prevented following his employment by *rheumatism* for three months; first seen by me August 30th, when he complained of violent pain in the shoulders and neck, which was so much affected that he was unable to turn his head; he complained also of great pain in the right clavicle, on examining which I found a considerable amount of *periosteal induration*, forming a *large swelling* near the sternal extremity. I pointed this out to my friend Mr. Beal, of Plaistow, and then, assisted by him, passed a current along the clavicle for about five minutes, *during which time the man said he felt the pain leaving him*, and, at the end of that period, *that the pain was gone*. On re-examining the part, *the swelling had disappeared*, but the man is still unable to lift his hands to his head.

Aug. 31st.—Finding much *induration* of the subcutaneous cellular tissue over the pectoralis major, I passed the current in the direction of the muscle, producing powerful and rapid contractions. I then passed the current from hand to hand for about ten minutes, when it caused a gentle diaphoresis, and *expelled the pain from the shoulder*, and enabled the hands to be elevated above the head without much difficulty.

Sept. 1st.—Neck very stiff and immovable, but not painful; the current was passed through it for a quarter of an hour, *after which it became capable of motion*.

Sept. 2nd.—Current again passed through the neck attended with good result.

Sept. 5th.—So much improvement has taken place, that the man says he shall go to work next week.

#### CASE THIRD.

Sept. 30th, 1851.—Sarah Whittaker, aged 70, states that in the month of February, 1851, she fell down a flight of stairs, fractured two ribs, and sprained her back, and was confined to her bed for seven or eight weeks afterwards; but never entirely recovered, having almost *lost the use of her right shoulder and neck*, so that she is unable to turn her head; has suffered frequently from rheumatism. On examination I found her very weak and thin, and the muscles of the right shoulder much smaller than those of the opposite side; there was no difference, however, in temperature or sensibility to the touch.

I passed an intermittent current through the back of the neck, which *relieved the pain*, and enabled her to turn her head; I afterwards passed the current from hand to hand for half an hour; it did not, however, produce so powerful an effect on her as it does on most persons; this is easily accounted for by her age, as I uniformly find young persons more susceptible to the influence of galvanism than are the old; it however considerably improved the power of motion in the shoulder.

Oct. 3rd.—Battery again used with good effect.

4th.—The current repeated.

5th.—Better; repeat the current.

7th.—Much better: can now lift her hand to the back of her head, and feels better than she has done since her accident; the current was again applied, and motion improved.

9th.—Said she had nothing to complain of.

N.B. When the word current occurs in the above cases, it is to be understood that in each instance the intermittent current was employed, produced either by the interrupting cylinder or clockwork.

T. J. VALLANCE, M.R.C.S., &c.

STRAFORD GROVE.

*Cases treated successfully with the Hydro-Electric Chain, by S. T. Evans, Esq., M.D., Physician to the Newmarket Dispensary.*

#### FIRST CASE.

Lady —. Habitual constipation of bowels for *fourteen years*, pain and great weakness, loss of appetite, &c. Bowels never moved except by the action of strong purgatives, taken almost every night, the

irritation caused by these being most injurious to the coat of the bowels. Enemas failed, until the Chain had been applied over the colon, and in contact with the spinal nerves. Now for two months not a particle of medicine has been taken, and an enema of the simplest kind, taken every third day, acts perfectly. The bowel is becoming healthy, the secretions all improved, the digestive functions gradually being restored, and the strength returning. This lady must have sunk had she continued her daily aperients; but now, as the enema acts, and the nervous power of the bowel is being restored by the action of your invaluable Chain, I do hope this patient will ultimately recover.

#### SECOND CASE.

Miss ——. Subject to constant nervous pain of her head and clavus, which nothing could benefit, is now, in an instant relieved by the application of the Chain along the forehead and from the occiput to the spine.

#### THIRD CASE.

Mrs. ——. Every winter suffers from rheumatic pains from the damp and cold of this climate. Little or no relief from medicine of any kind, change of clothing, &c.

I made her apply a Chain over the painful joints, which, in half an hour, were perfectly free from pain. The skin in the track of the Chain becomes red, and its application gives rise to a burning sensation, which soon disappears, and with it all pain of a rheumatic character. *She has had no return of the pain since two applications of the Chain.*

#### FOURTH CASE.

Mrs. ——. In other respects strong and healthy, has been subject to nervous headache of a very distressing kind, about two hours after breakfast, caused, in my opinion, by the loss of nervous energy from the head to the stomach, during the process of digestion. I made her get a Chain, No. 3, and put it round her forehead, it removed the pain, and does so every time. *It is gradually wearing away.*

#### FIFTH CASE.

Mr. —, an intellectual person, not very strong. After fatigue his mind becomes tired and incapable of continued thought. I advised him to try a Chain applied round the head and forehead, on the principle, that the energy of the brain becomes exhausted, either from bodily labor or mental fatigue. He did so, and has been capable of more continued application in either thinking or writing since. The brain becomes stimulated by the outward dose of galvanic or electric energy, supplied by the Chain in action, and which, before it, the brain had lost, either by its own loss of power directly, or indirectly by bodily fatigue; but its application in such cases should not be continued too long, for serious injury may result to the cerebral organism from constant and forced stimulation. *It deserves to be closely studied in relation to its action on the brains of intellectual individuals.*

From all I have seen of the action of the Hydro-Electric Chain up to the present, it appears to be an instrument, in the hands of medical men, of great value, and deserves a most general and extensive trial in all cases of nervous exhaustion, want of action in the colon, nervous and rheumatic pains, indigestion from atony, &c. &c.

I shall give it a trial in arrested labor from debility of the uterus; also in cases of amenorrhœa from want of tone and energy of the uterus.

S. T. EVANS, M.D., &c., &c.,

Physician to the Newmarket-on-Fergus Dispensary, &c. &c.

To C. MEINIG, Esq.

January, 1852.

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*Similar highly commendatory testimonials have been received from the following eminent members of the Profession, who have experienced and tested the effects of the Chain.*

DR. G. A. MANTELL, Fellow of Royal Society, L.L.D., and Fellow of Royal College of Surgeons.

DR. A. P. STEWART, M.D., M.R.C.P., London, Fellow R.M.C.S., Middlesex Hospital.

W. WICKENDEN, Esq., M.R.C.S., Fellow of the Geological Society.

J. T. SHEPPARD, Esq., Fellow R.C.S. Senior Surgeon to the Worcester Infirmary, Worcester.

DR. J. H. RANSOM, M.D., Lond. Nottingham.



ADOLPHUS BARNETT, Esq., M.B., London, M.R.C.S., &c. Poplar.  
DR. T. J. VALLANCE, Esq., M.D., M.R.C.S., &c., &c., Stratford.  
J. T. VALLANCE, Jun., Esq., M.R.C.S., &c., &c., Eng. Stratford.  
DR. HYDE SALTER, M.B., House Physician to King's College Hospital.  
CHARLES DAUKES, Esq., M.R.C.S., House Surgeon to London Hospital.  
WILLIAM WILTON, Esq., M.R.C.S., L.S.A., formerly Senior Surgeon to Brighton Lying-in Institution, Brighton.  
T. R. SIMONDS, Esq., M.R.C.S., L.S.A., Brighton.  
JOHN SMYTH, Esq., M.R.C.S., L.S.A., London, &c., Burgh, Lincolnshire.  
FRANCIS BERRINGTON, Esq., M.R.C.S., L.S.A., London.  
SIR WILLIAM STORY, M.R.C.S., Knight of the Order of St. Ferdinand, and late Surgeon to the Forces, Mile End.  
J. W. TATTON, Esq., University College.  
G. J. BLACKMAN, Esq., M.R.C.S., London.  
J. L. LEVISON, Esq., Surgeon, Brighton.  
C. H. GAMBLE, Esq., M.R.C.S., L.A.C., Reading Dispensary.  
GEORGE C. MILLER, Esq., M.R.C.S., London Hospital.  
DR. THOMAS ANSELL, M.D., M.R.C.S., Eng., L.S.A., Bow.  
TH. WOODFORD, Esq., M.R.C.S., London.  
CH. W. H. HOWELL, Esq., M.R.C.S., Eng., L.S.A., Stratford.  
GEORGE EVANS, Esq., House Surgeon to the Westminster Hospital.  
PROFESSOR GEO. H. BACKHOFNER, of the Royal Polytechnic Institution.  
P. L. SMYTH, Esq., L.S.A., Bow.  
NATHANIEL WARD, Esq., Fellow R.C.S., Surgeon to London Hospital.  
H. V. GARMAN, Esq., L.S.A., Surgeon to the K Division of Police, London.  
JOS. R. COOPER, Esq., M.R.C.S., Eng., L.A.C., London.  
RICHARD HUDSON COURTENAY, Esq., M.R.C.S., Surgeon Accoucheur to the Islington Lying-in Hospital; formerly Inspector of Hospitals for Central Board of Health in Ireland.  
THOMAS D. GRIFFITHS, Esq., M.R.C.S.E., Amlveh, Anglesea.  
PH. H. SMYTH, Esq., Surgeon, Devonshire House.  
C. MASSINGBERD, Esq., M.R.C.S., Holyhead.  
R. LLOYD, Esq., M.R.C.S., Dolgelly, N. Wales.  
F. GOOLDEN, Esq., M.R.C.S., L.S.A., Maidenhead.  
E. H. KINGLEY, Esq., M.R.C.S., Tottenham Park, Wilts.  
SILVANUS LONGMAN, Surgeon, Milborne Port.  
DR. HENRY JOHNSON, M.D., Senior Physician to the Salop Infirmary.  
JOHN H. BYWATER, Esq., Surgeon, L.S.A., Knottingley, Yorkshire.  
DR. A. GRAHAM, M.D., Retired Superintending Surgeon to the Bombay Army, Ramsgate.  
JOHN POOLE, Esq., Surgeon, Oxford-street, Liverpool.  
W. KENDALL, Esq., Surgeon, Budleigh, Devon.  
ARTHUR C. MORSE, Esq., M.R.C.S., L.A.C. Crewkerne, Somerset.  
CH. SYLVESTER, Esq., M.R.C.S., Cowbridge, Glamorgan.  
THOMAS NEWHAM, Esq., House Surgeon to the Chichester Infirmary.  
DR. J. B. THOMPSON, M.D., 5, Suffolk-place, Pall Mall East, London.  
DR. S. T. EVANS, M.D., Physician to the Newmarket-on-Fergus Dispensary, &c.  
DR. AVERY ROBERTS, M.D., Brighton.  
DR. W. DENNER, M.D., Gravel Hill House, Littleworth, near Stroud, Gloucestershire.  
JAMES R. WHYTE, Esq., M.R.C.S., Launcells, Cornwall.

5 SUFFOLK PLACE, PALL MALL EAST, January 22d, 1852.

SIR,—As far as I have been enabled to form an opinion as yet, in the cases subjected to your very ingenious invention, I am led to form a very favorable opinion of it as a therapeutic remedy, in many ANOMALOUS AND NERVOUS AFFECTIONS, and where the ordinary remedial agents may have proved inefficacious.

The cases simulating EPILEPSY, that have been subjected to the continuous current, appear to derive *considerable benefit* therefrom, and I trust may, after a prolonged application, prove more successful than the means hitherto had recourse to.

In certain AFFECTIONS OF THE KIDNEYS AND UTERUS I am led to expect much benefit to accrue from the Hydro-Electric Chain, *judging from what has already been done in a few cases.*

I am, Sir, yours, &c. &c.

J. B. THOMPSON, M.D.

To Mr. C. MEINIG.

CREWKERNE, SOMERSET, 20th Dec., 1851.

Sir,—Have the goodness to send me one of your Hydro-Electric Chains of 30 links.

I have applied one of 6 links to the face of a lady who had been suffering from SPASMS for three days—it afforded relief in two minutes, and its application to other parts of the body, several times, has had more or less beneficial effect.

I am, Sir, &c.,

ARTHUR C. MORSE,  
Surgeon, M. R. C. S. & L. A. C.

To C. MEINIG, Esq.

HOLYHEAD, Sept. 13th, 1851.

Sir,—I purchased a Chain of you a short time since, and find the effects on the person for whom it was intended highly satisfactory. I shall feel obliged by your sending a 6s. Chain (for the ancles), to W. C. T., Esq., Hull, for which I enclose 6s.; the case for which it is intended is a lady who, years ago, broke her ancle, and now suffers GREAT PAIN AND EXCESSIVE WEAKNESS.

I am, Sir, &c.,

C. MASSINGBERD,  
Surgeon.

C. MEINIG, Esq.

BRIGHTON, January 13th, 1852.

Sir,—I shall be obliged by the acknowledgment of the enclosed, and am happy in stating I am quite satisfied with the beneficial result of the Chain in *every instance of* NEURALGIC PAIN, *in which I have tried it.*

Believe me, Sir, your obedient servant,

C. MEINIG, Esq.

AVERY ROBERTS, M.D.

SUSSEX COUNTY HOSPITAL, BRIGHTON, January 13th, 1852.

Sir,—We will thank you to send us, at your earliest convenience, one of the Hydro-Electric Batteries of the full size, in a box, with the Interrupting Cylinder.

I am, Sir, your obedient Servant,

G. F. HODGSON, House Surgeon.

MR. C. MEINIG.

MR. MEINIG, on the 21st of September last, you sent me one of your invaluable Chains, No. 1. *It is impossible to speak too highly of its merits.* I wish also to have a smaller one, and request that you will send, &c., &c.

I remain your obedient servant,

GEORGE CRANFORD HEATH,  
King's College, Cambridge.

January 27th.

ST. MARYS HOSPITAL, Jan. 10th, 1852.

Sir,—Can you be kind enough to send one of your Hydro-Electric Chain Batteries, with directions, &c., for St. Mary's Hospital, Paddington.

Yours, &c.,

JOHN WILLIAM TROTTER,  
Resident Medical Officer.

Pulvermacher's Galvanic Chain Batteries appear to be very ingenious and efficient, and are certainly the most portable in proportion to their power of all that I have ever seen.

JAMES PAGET,  
Fellow Royal Society R.S., R.C.S., M.R.C.S.,  
St. Bartholomew's Hospital.

August 25, 1851.

From WM. HIGGINS, ESQ., Westover House,

CREWKERNE, SOMERSET, Jan. 9th, 1852.

Having for some days used the Hydro-Electric Chain Battery under the direction of Mr. Morse, Surgeon of this place, *with much benefit, &c. ....*

The REV. J. H. HARDING, Rectory, Ashley, near Market Drayton, having been directed by His Medical Adviser to apply to Mr. Meinig for a Hydro-Electric Chain, &c., &c.

My medical man advises the No. 2 Chain at 18s. 10d., &c.

JOHN TAYLOR,  
Bell Foundry, Loughborough.

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*From the following Hospitals highly favorable Reports have been received.*

Guy's Hospital, Southwark—London Hospital, London—University College Hospital, London—King's College Hospital, Westminster—St. Bartholomew's Hospital, London—Royal Free Hospital, London—Charing Cross Hospital, Westminster—German Hospital, Dalston—Allgemeine Krankenhaus (the principal Hospital,) Vienna—Hospital of Wieden, near Vienna—Hospital Bougeon, at Paris—Hospital St. Louis, at Paris, &c. &c.

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*Favorably reported by*

THE ROYAL COLLEGE OF PHYSICIANS IN LONDON, in the Meeting of 23th June, 1851.

THE ROYAL COLLEGE OF SURGEONS IN LONDON, in the Meeting of 2d July, 1851.

THE ROYAL BRITISH ASSOCIATION, in the Meeting at Ipswich, 8th July, 1851.

THE PROVINCIAL MEDICAL AND SURGICAL ASSOCIATION, in the Meeting at Brighton, the 13th and 14th August, 1851.

THE PHARMACEUTICAL SOCIETY, LONDON, in the Meeting, the 3d January, 1851.

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## FRANCE.

(TRANSLATION.)

*Extract of a report made to the National Academy of Medicine, at Paris, at its meeting on the 1st of April, 1851. Commissioners: MESSIEURS BERARD, BOUVIER, GAULTIER DE CLAUERY, GUENEAU DE MUSSY, LONGET, POISENILLE. Reporter: MONSIEUR SOUBEYRAN.*

EXPERIENCES SCIENTIFIQUES.—“The Voltaic Chains of Mr. Pulvermacher, are really a most wonderful apparatus. It is astonishing to see these little piles, with pole plates and ribbons beautifully arranged, and adapting themselves exactly to the form of the body, capable of producing—under this small volume—the most surprising effects.

“The Commission begs to propose to the Academy to address their thanks to Mr. Pulvermacher, for his most interesting communication.”—*Bulletin de l'Academie, Tome XVI., No. 13.*

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*Short explanation added to the report by Dr. Bouvier, one of the members of the Commission on the Chain Batteries for Doctors of Medicine, constructed on the same principle as the Portable Chains.*

“They unite henceforward two advantages, which no other apparatus does possess until now; they are more portable and cheaper, two indispensable conditions in an apparatus of this description, in order to make the application of electricity, as yet so little known, more general, and to a certain degree popular; which is certainly very desirable in the interest of patients, as well as of the profession itself. In this respect the Chains of Mr. Pulvermacher will have a great future, so much more as they are constantly being improved, and as new modifications may still add to their perfection, and to their utility in the treatment of disease.” (Adopted.)

ACADEMIE NATIONALE DE MEDICINE:

PARIS, 3d April, 1851.

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*The Perpetual Secretary of the Academy to DR. PULVERMACHER, of Vienna (Austria).*

SIR:

I am happy to inform you that the commission, elected by the Academy to examine your Voltaic Chains, made its report on Tuesday last, to the Academy, through the medium of Monsieur Soubeyran.



The Academy, Sir, after having heard the reading of the report, offers you, through me, their best thanks for your highly interesting communication.

Accept, Sir, the assurance of my particular esteem.

(Signed,)

DUBOIS.

*The Hydro Electric Voltaic Chains are at present before the Académie des Sciences, which has elected a special Committee (Messieurs Bequerel and Pouillet) to try the Chain in chemical and physical experiments.*

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MEDICAL EMPLOYMENT OF PULVERMACHER'S HYDRO ELECTRIC CHAINS, BY L. FELDMANN, M.D., 9 RUE MAZAGRAN, PARIS.

FIRST CASE.

Towards the end of the month of March, I was attacked during the night with rheumatic pains on the right side of my neck; the next morning I little cared about these pains, although they increased every hour, but towards evening I could not freely turn my head, neither lift my arms without pains in my right shoulder.

Having laid down at midnight, and not having at hand any camphorated oil to rub with, I put Chain of fifty elements round my neck; I covered it with a handkerchief, and then fell asleep. I awoke several times during the night, which, no doubt, arose from the fact of not being accustomed to wear a metallic cravat of that description.

Next morning the rheumatic pains had greatly diminished; the following night I no longer put on the Chain, and the morning following that night the pains had disappeared.

One might suppose that this trifling rheumatic affection might have passed away by keeping warm, still I had at the same time to treat rheumatism, which could not be cured by warm fomentations or by warm baths, of which the patients fancied to derive benefit, but electricity, penetrating into the body, has stopped the suffering in twenty-four hours.

SECOND CASE.

A short time after having made this trial of the Chains upon myself, Mr. L——, age thirty-three years, professor of the English language, came to me, asking for a remedy against rheumatic pains, of which he suffered a great deal in the back, as well as in the right shoulder, above a week. Although he kept himself enveloped in flannels, day and night, these pains, far from diminishing, grew in intensity. The occupation of Mr. L—— not permitting him to undergo a treatment of long duration, I advised him to wear an Electric Chain, which he did the same evening, putting the Chain on the suffering parts; he left it there next day, the following night and the day afterwards. Already, the first night, the pains got much less, and on the third day, when the patient came to me again, he felt but a slight pain, by turning the head towards the shoulder, when—on his first visit to me—he could move his head but with the most excruciating pains.

OBSERVATION.—The great Chains (batteries) must not generally be used in these cases; I only used them because I had none of the portable (small) ones at my disposal then.

I must mention a physical experiment which I have made with the Electric Chains.

I dipped two small (portable) Chains into water, and then hung them up for two or three minutes in the air. The influence of the air, or rather of the oxygen in the air, in this little time, on the wet Chains, was sufficient to excite electricity, and this electricity was perceptible to the touch of the hand, also moistened with water, if taken at the extremities of each Chain.

THIRD CASE.

In consequence of violent effort, Mrs. B——, at the end of last April, felt a disease in the sides, which extended slowly to the back, so much that she was obliged to keep in bed for several days. On the 14th of the following June, she had another similar accident, and on the evening of the same day she could only walk by stooping down. The pains had now gone up to the shoulder-plates, when Mrs. B. sent for me. Knowing, from experience, the good and happy results of the Electric Chains, I employed them on the spot, putting on the side of this lady a small Chain, of sixteen elements, which I fixed with a silk handkerchief, with which I also covered the Chain.

Mrs. B—— passed a quiet night, and on the next day the pains had disappeared.

The following case is an illustration of the remarkable effects of the Chain Batteries.

Miss G—— suffered several days of a nervous headache, particularly in the forehead. Not as a remedy, but as an amusing experiment, Miss G. passed, several times, electric shocks from one hand to the other, with two Chains, which she held separated, one in each hand, and bringing them in contact.

Her surprise and joy were great when, after having finished these experiments, she felt her headache had entirely left her.

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*Extract of a letter of Ad: Amedee Latour, M.D., at Paris, published in the "Union Medicale," Tome VI., page 33.*

"The Voltaic Pile will change the whole world, said Napoleon the First, and the present Napoleon promises a great reward to its promoter; thus it is with great satisfaction that the followers of *Æsculap* have observed that a premium of 50,000 francs will be awarded to the perfecter of electricity, and that its application for medical practice is amongst the conditions to be fulfilled by the competitors. The question of Electric Apparatus, their convenience and price, is an important question for gentlemen of the profession. A German professor of Physics, Mr. Pulvermacher, appears to me to have solved this question, by his apparatus, through which the application of the Voltaic pile can be made familiar and of a precious advantage."

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*Extract of a letter of Emanuel Roche, M.D., Paris, published in the "Revue Clinique."*

"We freely acknowledge that these Chains are an inexhaustible source of electricity. We really must confess that we have had results of them which touch the marvellous; but it is necessary that our brethren in science practice and judge by themselves.

"The invention of Mr. Pulvermacher is a real and considerable progress. We can certify that it is a great point obtained in science. We cannot but express our desire, that our brethren might engage and occupy themselves with this mysterious science, which certainly will accomplish still the most curious, and perhaps the most useful, discoveries which will be open for human speculation. And in their name, we advise the inventor to sell his apparatus at the very lowest price, and that he may bear in mind that the economical application of electricity in the medical practice, is one condition for the premium of 50,000 francs, offered by our government to all Savants of the world."

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*Extract of a letter of Monsieur Sainte Preuve, published in the journal "L'Industrie," No. 12.*

"The success of Mr. Pulvermacher's Chains is founded on the real and evident value of their apparatus, as well as on their low price, comparing them to the value of other medical electric apparatus, we say; and, indeed, the experiments daily made with them in Paris, to any one who visits the stores of Mr. Meinig, who is sole agent here for this invention, permit the most ignorant person to convince himself that their apparatus develops, quickly, sufficient electricity, and abundantly too, to produce in the human body those continuous commotions, quick and vibrating, which are vindicated by the medical profession. After having witnessed these experiments, every one will be convinced of the possibility of a happy medical employment of this small and ingenious contrivance."

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*Extract of a letter of M. F. Rouboux, M. D., on the Hydro Electric Chains, published in the "L'Illustration de Paris."*

"By the simple arrangement (of diminishing or multiplying the number of links or the power of the acid) the intensity of the Galvanism may be regulated to any degree, which is of the highest importance in medical practice. A further advantage of these Chains is that they adapt themselves to any part of the body, so that the influence of electricity may be limited to any suffering part."

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*Extract of a letter of Dr. M. E. Müller. St. Croix, pris Ste Marie (Haut Rhin).*

"Availing myself of this opportunity, I must tell you that I have employed the Chains by making them act continually against a Rheumatic Neuralgia of the muscles in the head, periodically accompanied with spasms, painful and depressing giddiness in applying the Chains, by fixing the two pole plates behind, and a little lower than the ears, the Chain hanging down in front. This brought on an eruption similar to that produced by Croton Oil; it still exists, and has produced a very perceptible amelioration."

(Signed,) MÜLLER, M. D.

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*Of Monsieur E. Laporte, M.D., à Raligny (Allier).*

You have sent me already a Hydro Electric Chain, of thirty elements; I have applied it in several affections with such success that I shall henceforward continue to employ your apparatus.

I, the undersigned, Doctor of Medicine of the faculty at Paris, professor in the clinique (ventilair) medicine, oculist, etc., do hereby certify that the Hydro Electric Chain of Mr. Pulvermacher produces the happiest result in the treatment of nervous diseases of the eyes, such as amanurosis, convulsive agitation of the eye-balls, etc. It affords me a particular pleasure to certify to the excellence of this apparatus, which is sure to render still the greatest services in the treatment of nervous diseases, of whatever description they may be.

PARIS, 23d of June, 1852.

(Signed,)

A. FRANCON de PREOUX.  
48 Rue de la Chaussee d'Antin, á Paris.

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## GERMANY:

AUSTRIA, PRUSSIA, SAXONY, Etc., Etc.

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I, the undersigned, do hereby certify that the Hydro Electric Chains of Mr. Pulvermacher may be applied with the greatest advantage in *all cases* wherever electricity may be indicated.

OPPOLZER, M. D.

Physician to the Court, Head Physician of the principal  
Hospital at Vienna, (Allgemeines Krankenhaus), etc., etc.

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The trials which were made by the undersigned during several months with the Hydro Electric Chains of Mr. Pulvermacher, in those cases of chronic Rheumatism, as well as in those paralytic forms of disease originating in them, have sufficiently shown that this effect on the human organization is not only very invigorating, but that their curative power was also a corresponding one.

JAEGER, M. D.,

Professor and directing physician in the Clinique  
for diseases of the Eyes, in Vienna, etc., etc.

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Similar testimonials have been signed by:

Prof. PIESCHEL, Prof. MERBACH, Councillor of Medicine, MULLER, Prof. GUNTHER, Dr. H. E. RICHTER, Dr. HEIDEWEICH, Dr. SCHMALZ, etc., etc.

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### EXTRACTS.

*Dr. Heideureich in his reports on the progress in Therapeutical physics.*

"J. L. Pulvermacher, at Vienna (Mariahilf No. 27), sells Hydro Electric Chains which really produce a great deal of electricity. \* \* \* \*

"I have succeeded with these Chains in deflecting the needle of the Galvanometer, in decomposing water, in the solution of (Jodkalium), in the reduction of the nitrate of protoxyde of Mercurey, and oxyde of silver, in obtaining contraction of the prepared frogsleg, and on my own forehead I observed the prickling sensation as a result of these Chains. Being in this manner physical and physiological real Electro-motors, these Chains may easily be brought into use in therapeutic application. Indeed, these Chains excited at the place where the current is interrupted by the glass cylinder and passes through the body, red spots like small blisters, and showed decided effect in cases of Rheumatism, where I applied it." Etc., etc., etc.

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*Extract from the "Feuilleton der deutschen (German) Clinique," of the 13th March, 1852.*

[Tested together with Drs. Jahn, Dietzel, Schmitt, professors of Physics and Mechanics, at the University and Polytechnic Institution at Zittau (Saxony), by Dr. Kuchenmeister, at Zittau.]

"With regard to the effects of Pulvermacher's Hydro Electric Chains, we may say of them:

1. That even the smallest Chains of \$1, consisting of six spiral pairs, decompose water in a small ap-

paratus; shocks are not felt by them. Taste very energetic, with prickling sensation. The Astatic Needle turns right round, and turns itself on its axis several times.

2. The said effects increase with the size of the apparatus; they produce at last (taking large Chains,) insupportable contractions on opening and perfecting the electric circle. If a Portable Chain is put to the temples, the well known apparition of light is observed.

(They then continue pointing out to professional gentlemen a great many cases in which the Hydro-Electric Chains may be employed with evident advantage,) and conclude:

*I should be glad indeed, if these lines would tend to bring Pulvermacher's Chains more in general use.*

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*Extract from the Central Medical Times (Medicinische Central Zeitung) of 21st of April, 1852, by Dr. L. POSNER, Editor of the Medical Central Times.*

“These demonstrations convinced everybody that Pulvermacher's Chains offered material advantages for medical practice, and that they may be employed for the production of the mildest or of the strongest form of electricity.

“The persons who were present had an opportunity of convincing themselves of the efficiency of the Chains by the touch as well as by the galvanometer (which were perceptible already with a single element if brought in contact with the hand.) etc., etc., etc.

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Similar Correspondence may be referred to—

#### IN ENGLAND:

Medical Times, Times, Morning Chronicle, Daily News, Lancet, Mining Journal, Civil Engineer's Journal, London Journal, Chemical Records, Agricultural Magazine, Brighton Herald, etc., etc.

#### IN FRANCE:

Gazette de Hopitaux, Journal des Debats, Presse, Union Medicale, L'Industrie, Revue Clinique, etc. etc.

#### IN GERMANY:

Constitutionelle Zeitung, Spensersche Zeitung, In der Zeit, Feuilleton der Deutschen Clinique, Medizinische Central Zeitung, etc., etc.











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